

CLAIMS

1. A method for imaging molecules contained in an array of discrete reaction sites on the surface of a solid support, comprising:
  - (i) imaging the array and detecting a first molecule located on the solid support
  - 5 at a known position with respect to the array;
  - (ii) by reference to the first molecule, aligning inspection windows in registration with the discrete reaction sites; and
  - (iii) determining the amount of detectable signal in each window.
2. A method according to claim 1, wherein detection of the first molecule is carried
- 10 out by aligning a first inspection window within a region of the support that includes the first molecule and searching within the window for an image of the first molecule.
3. A method according to claim 2, wherein the first inspection window defines a two-dimensional array of pixels and searching is carried out by scanning diagonally the array of pixels and determining values for the pixels.
- 15 4. A method according to claim 2 or claim 3, wherein, after detecting the first molecule, the first inspection window is repositioned or enlarged so that one or more of the discrete reaction sites is also located within the window, detecting the one or more sites and, by reference to the first molecule and the one or more sites, aligning a further inspection window in registration with each reaction site of the array.
- 20 5. A method according to any preceding claim, wherein the array of reaction sites defines a corner within which the first molecule is located.
6. A method according to any preceding claim, wherein step (i) further comprises detecting a second molecule located on the solid support at a known position with respect to the array, and aligning the inspection windows by reference to both first and
- 25 second molecules.
7. A method according to any preceding claim, wherein imaging is carried out by detecting emitted radiation.
8. A method according to claim 7, wherein the radiation is chemiluminescent, bioluminescent or fluorescent.
- 30 9. A method according to any preceding claim, wherein the molecules of the array are capable of reacting with an analyte.
10. A method according to any preceding claim, wherein the molecules of the array are polynucleotides, antibodies, proteins or organic compounds.
11. A method according to any preceding claim, wherein the solid support is less
- 35 than 1 cm<sup>2</sup>.

12. A method according to any preceding claim, wherein the solid support is a ceramic, silicon or glass material.
13. A method according to any preceding claim, wherein the molecules of the array are covalently attached to the surface of the solid support.
14. A method according to any preceding claim, wherein the image generated in step (i) must be above a pre-defined value in order to proceed with steps (ii) and (iii).
15. A computer programmed to carry out a method according to any preceding claim.
16. An imaging device controlled by a computer according to claim 15.